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<120> Process for typing of HCV isolates

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<140> 09/899,082

<141> 2001-07-06

<150> 09/378,900

<151> 1999-08-23

<150> 09/044,665

<151> 1998-03-19

<150> 08/256,568

<151> 1994-07-18

<150> PCT/EP93/03325

<151> 1993-11-26

<150> EP92403222

<151> 1992-11-27

<150> EP93402129

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ctcggaaatt tgggcgtgcc cccgcaagac tgctagccga gtagtggttg gtcgcga 177

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<211> 177

<212> DNA

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ctcggaaatt tgggcgtgcc cccgcaagac tgctagccga gtagtggttg gtcgcga 177

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<212> DNA

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cctggaaatt tgggcgtgcc cccgcaagac tgctagccga gtagtggttg gtcgcga 177

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ggtgagttca ccggaatcgc caggacgacc gggtcctttc ttggattaac ccgctcaatg 120

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Glu Arg Leu Tyr Ile Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Leu Lys Ala Ser Ala Ala Cys Arg Ala
65 70 75 80

Ala Lys Leu Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Ile Cys Glu Ser Ala Gly Thr Gln Glu Asp Ala Ala Ser Leu Arg
100 105 110

Val

<210> 83
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<212> PRT
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<400> 83

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25

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 35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Phe Thr Thr Ser Met
 50 55 60

Gly Asn Thr Met Thr Cys Tyr Ile Lys Ala Leu Ala Ala Cys Lys Ala
 65 70 75 80

Ala Gly Ile Val Asp Pro Val Met Leu Val Cys Gly Asp Asp Leu Val
 85 90 95

Val Ile Ser Glu Ser Gln Gly Asn Glu Glu Asp Glu Arg Asn Leu Arg
 100 105 110

Ala

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 35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Phe Thr Thr Ser Met
 50 55 60

Gly Asn Thr Ile Thr Cys Tyr Val Lys Ala Gln Ala Ala Cys Lys Ala
 65 70 75 80

Ala Gly Ile Ile Ala Pro Thr Met Leu Val Cys Gly Asp Asp Leu Val
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Val Ile Ser Glu Ser Gln Gly Thr Glu Glu Asp Glu Arg Asn Leu Arg
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Ala

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35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Pro Thr Ser Phe
50 55 60

Gly Asn Thr Ile Thr Cys Tyr Ile Lys Ala Thr Thr Ala Ala Lys Ala
65 70 75 80

Ala Gly Leu Arg Asn Pro Asp Phe Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Val Ala Glu Ser Asp Gly Val Asp Glu Asp Arg Ala Ala Leu Arg
100 105 110

Ala

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Glu Arg Leu Tyr Val Gly Gly Pro Met His Asn Ser Lys Gly Asp Leu
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Tyr Thr Thr Ser Phe
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Leu Lys Ala Ser Ala Ala Ile Lys Ala
65 70 75 80

Ala Gly Leu Arg Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Ile Ala Glu Ser Asp Gly Val Glu Glu Asp Lys Arg Pro Leu Gly
100 105 110

Ala

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Ser Thr Val Thr Glu Lys Asp Ile Arg Val Glu Glu Glu Val Tyr Gln
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Cys Cys Asp Leu Glu Pro Glu Ala Arg Arg Ala Ile Thr Ala Leu Thr
20 25 30

Glu Arg Leu Tyr Val Gly Gly Pro Met His Asn Ser Arg Gly Asp Leu
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Tyr Thr Thr Ser Phe
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Leu Lys Ala Ser Ala Ala Ile Arg Ala
65 70 75 80

Ala Gly Leu Arg Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Ile Ala Glu Ser Asp Gly Val Glu Glu Asp Lys Arg Ala Leu Gly
100 105 110

Ala

<210> 88
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 88

Ser Thr Val Thr Glu Lys Asp Ile Arg Val Glu Glu Glu Val Tyr Gln
1 5 10 15

Cys Cys Asp Leu Glu Pro Glu Ala Arg Lys Val Ile Thr Ala Leu Thr
20 25 30

Glu Arg Leu Tyr Val Gly Gly Pro Met His Asn Ser Lys Gly Asp Leu
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Tyr Thr Thr Ser Phe
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Leu Lys Ala Ser Ala Ala Ile Arg Ala
65 70 75 80

Ser Gly Leu Arg Asp Cys Thr Met Leu Val Tyr Gly Asp Asp Leu Val
85 90 95

Val Ile Ala Glu Ser Asp Gly Val Glu Glu Asp Lys Arg Ala Leu Gly
100 105 110

Val

<210> 89
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 89

Ser Thr Val Thr Glu Lys Asp Ile Arg Val Glu Glu Glu Val Tyr Gln
1 5 10 15

Cys Cys Asp Leu Glu Pro Glu Ala Arg Lys Ala Ile Thr Ala Leu Thr
20 25 30

Glu Arg Leu Tyr Val Gly Gly Pro Met His Asn Ser Lys Gly Asp Leu
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Tyr Thr Thr Ser Phe
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Leu Lys Ala Ser Ala Ala Ile Arg Ala
65 70 75 80

Ala Gly Leu Arg Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Ile Ala Glu Ser Asp Gly Val Glu Glu Asp Lys Arg Ala Leu Gly
100 105 110

Ala

<210> 90
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 90

Ser Thr Val Thr Glu Arg Asp Ile Arg Thr Glu Glu Glu Ile Tyr Gln
1 5 10 15

Cys Cys Asp Leu Glu Pro Glu Ala Arg Lys Val Ile Ser Ala Leu Thr
20 25 30

Glu Arg Leu Tyr Val Gly Gly Pro Met Tyr Asn Ser Lys Gly Asp Leu
35 40 45

Cys Gly Gln Arg Arg Cys Arg Ala Ser Gly Val Tyr Thr Thr Ser Phe
50 55 60

Gly Asn Thr Val Thr Cys Tyr Leu Lys Ala Val Ala Ala Thr Arg Ala

<213> hepatitis C virus

<400> 92

Ser Thr Val Thr Glu His Asp Ile Met Thr Glu Glu Ser Ile Tyr Gln
1 5 10 15

Ser Cys Asp Leu Gln Pro Glu Ala Arg Ala Ala Ile Arg Ser Leu Thr
20 25 30

Gln Arg Leu Tyr Cys Gly Gly Pro Met Tyr Asn Ser Lys Gly Gln Gln
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Phe Thr Thr Ser Met
50 55 60

Gly Asn Thr Met Thr Cys Tyr Ile Lys Ala Leu Ala Ser Cys Arg Ala
65 70 75 80

Ala Arg Leu Arg Asp Cys Thr Leu Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Ala Ile Cys Glu Ser Gln Gly Thr His Glu Asp Glu Ala Ser Leu Arg
100 105 110

Ala

<210> 93

<211> 18

<212> DNA

<213> artificial

<220>

<223> artificial

<400> 93

gagtgttgta cagcctcc

18

<210> 94

<211> 17

<212> DNA

<213> artificial

<220>

<223> artificial

<400> 94	
tgcccggaaa tttgggc	17
<210> 95	
<211> 16	
<212> DNA	
<213> artificial	
<220>	
<223> artificial	
<400> 95	
tgcccggaga tttggg	16
<210> 96	
<211> 17	
<212> DNA	
<213> artificial	
<220>	
<223> artificial	
<400> 96	
gagtgtcgaa cagcctc	17
<210> 97	
<211> 16	
<212> DNA	
<213> artificial	
<220>	
<223> artificial	
<400> 97	
gggggcctgg aggctg	16
<210> 98	
<211> 260	
<212> DNA	
<213> hepatitis C virus	
<400> 98	
ccaccatgaa tcactcccct gtgaggaact actgtcttca cgcagaaagc gtctagccat	60
ggcgtagta tgagtgtcgt gcagcctcca ggaccccccc tcccgggaga gccatagtgg	120
tctgcggaac cggtgagtac accggaattg ccaggacgac cgggtccttt cttggatcaa	180
cccgtcaat gcctggagat ttgggcgtgc ccccgaaga ctgctagccg agtagtggtg	240
ggtcgcgaaa ggccttgggt	260

<210> 99
<211> 260
<212> DNA
<213> hepatitis C virus

<400> 99
ccaccataga tcactcccct gtgaggaact actgtcttca cgcagaaagc gtctagccat 60
ggcgtttagta tgagtgttgt gcagcctcca ggaccccccc tcccgggaga gccatagtgg 120
tctgcggaac cggtagtac accggaattg ccaggacgac cgggtccttt cttggatcaa 180
cccgtcaat gcctggagat ttgggcgtgc ccccgcgaga ctgctagccg agtagtggtg 240
ggtcgcgaaa ggccttgggt 260

<210> 100
<211> 260
<212> DNA
<213> hepatitis C virus

<400> 100
ccgccatgaa ccactcccct gtgaggaact actgtcttca cgcagaaagc gtctagccat 60
ggcgtttagta tgagtgtcgt acagcctcca ggcccccccc tcccgggaga gccatagtgg 120
tctgcggaac cggtagtac accggaattg cccggaagac tgggtccttt cttggataaa 180
cccactctat gcccggtcat ttgggcgtgc ccccgcaaga ctgctagccg agtagcggtg 240
ggttgcgaaa ggccttgggt 260

<210> 101
<211> 260
<212> DNA
<213> hepatitis C virus

<400> 101
ccgccatgaa tcactcccct gtgaggaact actgtcttca cgcagaaagc gtctagccat 60
ggcgtttagta tgagtgtcgt acagcctcca ggcccccccc tcccgggaga gccatagtgg 120
tctgcggaac cggtagtac accggaatta cccgaaagac tgggtccttt cttggataaa 180
cccactctat gtccggtcat ttgggcacgc ccccgcaaga ctgctagccg agtagcggtg 240
ggttgcgaaa ggccttgggt 260

<210> 102
<211> 190
<212> DNA
<213> hepatitis C virus

<400> 102

cgagtgtcgt gcagcctcca ggaccccccc tcccgggaga gccatagtgg tctgcggaac	60
cggtgagtac accggaatcg ctgggggtgac cgggtccttt cttggaacaa cccgctcaat	120
accagaaat ttgggcgtgc cccgcgaga tcactagccg agtagtggtg ggtcgcgaaa	180
ggccttgggt	190

<210> 103
 <211> 227
 <212> DNA
 <213> hepatitis C virus

<400> 103	
gtcttcacgc agaaagcgtc tagccatggc gttagtatga gtgttgata gcctccagga	60
ccccccctcc cgggagagcc atagtggctc gcggaaccgg tgagtacacc ggaatcgctg	120
gggtgaccgg gtcctttctt ggataaacc gctcaatgcc cggaaatttg ggcgtgcccc	180
cgaagactg ctagccgagt agtggtgggt cgcgaaaggc cttgggt	227

<210> 104
 <211> 177
 <212> DNA
 <213> hepatitis C virus

<400> 104	
gagtgtcgtg cagcctccag gccccccct cccgggagag ccatagtggc ctgcggaacc	60
ggtgagtaca ccggaatcgc cgggatgacc gggtcctttc ttggaacaac ccgctcaatg	120
cccggaaatt tgggcgtgcc cccgcgagat cactagccga gtagtggtg gtcgcga	177

<210> 105
 <211> 109
 <212> DNA
 <213> hepatitis C virus

<400> 105	
gagtgttgta cagcctccag gccccccct cccgggagag ccatagtggc ctgcggaacc	60
ggtgagtaca ccggaatcgc cgggatgacc gggtcctttc ttggatcaa	109

<210> 106
 <211> 109
 <212> DNA
 <213> hepatitis C virus

<400> 106	
gagtgttgta cagcctccag gacccccct cccgggagag ccatagtggc ctgcggaacc	60
ggtgagtaca ccggaatcgc caggacgacc gggtcctttc ttggatcaa	109

<210> 107
 <211> 109
 <212> DNA
 <213> hepatitis C virus

<400> 107
 gagtgttgta cagcctccag gacccccccct cccgggagag ccatagtggg ctgcggaacc 60
 ggtgagtaca ccggaatcgc cgggatgacc gggtcctttc ttggataaa 109

<210> 108
 <211> 177
 <212> DNA
 <213> hepatitis C virus

<400> 108
 gagtgtcgaa cagcctccag gacccccccct cccgggagag ccatagtggg ctgcggaacc 60
 ggtgagtaca ccggaattgc cgggatgacc gggtcctttc ttggataaac ccgctcaatg 120
 cccggagatt tgggcgtgcc cccgcgagac tgctagccga gtagtggtgg gtcgcga 177

<210> 109
 <211> 180
 <212> DNA
 <213> hepatitis C virus

<400> 109
 gagtgtcgta cagcctccag gccccccct cccgggagag ccatagtggg ctgcggaacc 60
 ggtgagtaca ccggaattgc caggatgacc gggtcctttc cattggatca aaccgctca 120
 atgcctggag atttgggcgt gcccccgcaa gactgctagc cgagtagtgt tgggtcgcga 180

<210> 110
 <211> 112
 <212> DNA
 <213> hepatitis C virus

<400> 110
 gagtgtcgta cagcctccag gccccccct cccgggagag ccatagtggg ctgcggaacc 60
 ggtgagtaca ccggaattgc caggatgacc gggtcctttc cattggatca aa 112

<210> 111
 <211> 113
 <212> PRT
 <213> hepatitis C virus

<400> 111

Ser Thr Val Thr Glu Ser Asp Ile Arg Thr Glu Glu Ala Ile Tyr Gln
1 5 10 15

Cys Cys Asp Leu Asp Pro Gln Ala Arg Val Ala Ile Lys Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Val Gly Gly Pro Leu Thr Asn Ser Arg Gly Glu Asn
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Ile Lys Ala Arg Ala Ala Cys Arg Ala
65 70 75 80

Ala Gly Leu Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Ile Cys Glu Ser Ala Gly Val Gln Glu Asp Ala Ala Ser Leu Arg
100 105 110

Ala

<210> 112
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 112

Ser Thr Val Thr Glu Ser Asp Ile Arg Thr Glu Glu Ala Ile Tyr Gln
1 5 10 15

Cys Cys Asp Leu Asp Pro Gln Ala Arg Val Ala Ile Arg Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Val Gly Gly Pro Leu Thr Asn Ser Arg Gly Glu Asn
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Ile Lys Ala Arg Ala Ala Cys Arg Ala
65 70 75 80

Ala Gly Leu Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Ile Cys Glu Ser Ala Gly Val Gln Glu Asp Ala Ala Ser Leu Arg
100 105 110

Ala

<210> 113
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 113

Ser Thr Val Thr Glu Ser Asp Ile Arg Thr Glu Glu Ala Ile Tyr Gln
1 5 10 15

Cys Cys Asp Leu Asp Pro Gln Ala Arg Val Ala Ile Lys Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Val Gly Gly Pro Leu Thr Asn Ser Arg Gly Glu Asn
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Arg Val Leu Thr Thr Ser Cys
50 55 60

Gly Asn Thr Leu Thr Arg Tyr Ile Lys Ala Arg Ala Ala Cys Arg Ala
65 70 75 80

Ala Gly Leu Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Ile Cys Glu Ser Ala Gly Val Gln Glu Asp Ala Ala Ser Leu Arg
100 105 110

Ala

<210> 114
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 114

Ser Thr Val Thr Glu Asn Asp Ile Arg Thr Glu Glu Ser Ile Tyr Gln
1 5 10 15

Cys Cys Asp Leu Ala Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Val Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Leu Lys Ala Thr Ala Ala Cys Arg Ala
65 70 75 80

Ala Lys Leu Gln Asp Cys Thr Met Leu Val Asn Gly Asp Asp Leu Val
85 90 95

Val Ile Cys Glu Ser Ala Gly Thr Gln Glu Asp Ala Ala Ala Leu Arg
100 105 110

Ala

<210> 115

<211> 113

<212> PRT

<213> hepatitis C virus

<400> 115

Ser Thr Val Thr Glu Ser Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln
1 5 10 15

Cys Cys Asp Leu Ala Pro Glu Ala Arg Gln Val Ile Arg Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Ile Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Asn Cys
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Leu Lys Ala Ser Ala Ala Cys Arg Ala
65 70 75 80

Ala Lys Leu Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Ile Cys Glu Ser Ala Gly Thr Gln Glu Asp Ala Ala Ser Leu Arg
100 105 110

Val

<210> 116
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 116

Ser Thr Val Thr Gln Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln
1 5 10 15

Cys Cys Asp Leu Ala Pro Glu Ala Arg Arg Ala Ile Lys Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Ile Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Leu Lys Ala Ser Ala Ala Cys Arg Ala
65 70 75 80

Ala Lys Leu Gln Asp Cys Thr Met Leu Val Asn Gly Asp Asp Leu Val
85 90 95

Val Ile Cys Glu Ser Ala Gly Thr Gln Glu Asp Ala Ala Ser Leu Arg
100 105 110

Val

<210> 117

<211> 113
<212> PRT
<213> hepatitis C virus

<400> 117

Ser Thr Val Thr Glu Ser Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln
1 5 10 15

Cys Cys Asp Leu Ala Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Ile Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Leu Lys Ala Ser Ala Ala Cys Arg Ala
65 70 75 80

Ala Lys Leu Gln Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Ile Cys Glu Ser Ala Gly Thr Gln Glu Asp Ala Ala Ser Leu Arg
100 105 110

Val

<210> 118
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 118

Ser Thr Val Thr Glu Ser Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln
1 5 10 15

Cys Cys Asp Leu Ala Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Ile Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Leu Lys Ala Thr Ala Ala Cys Arg Ala
65 70 75 80

Ala Lys Leu Gln Asp Cys Thr Met Leu Val Asn Gly Asp Asp Leu Val
85 90 95

Val Ile Cys Glu Ser Ala Gly Thr Gln Glu Asp Ala Ala Ala Leu Arg
100 105 110

Ala

<210> 119
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 119

Ser Thr Val Thr Glu Ser Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln
1 5 10 15

Cys Cys Asp Leu Ala Pro Glu Ala Arg Gln Ala Ile Lys Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Ile Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Leu Lys Ala Thr Ala Ala Cys Arg Ala
65 70 75 80

Ala Lys Leu Gln Asp Cys Thr Met Leu Val Asn Gly Asp Asp Leu Val
85 90 95

Val Ile Cys Glu Ser Ala Gly Thr Gln Glu Asp Ala Ala Ser Leu Arg
100 105 110

Val

<210> 120
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 120

Ser Thr Val Thr Glu Ser Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln
1 5 10 15

Cys Cys Asp Leu Ala Pro Glu Ala Arg Gln Ala Ile Lys Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Ile Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys
50 55 60

Gly Asn Thr Leu Thr Cys Tyr Leu Lys Ala Thr Ala Ala Cys Arg Ala
65 70 75 80

Ala Lys Leu Gln Asp Cys Thr Met Leu Val Asn Gly Asp Asp Leu Val
85 90 95

Val Ile Cys Glu Ser Ala Gly Thr Gln Glu Asp Ala Ala Ser Leu Arg
100 105 110

Val

<210> 121
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 121

Ser Thr Val Thr Glu Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln
1 5 10 15

Cys Cys Asp Leu Ala Pro Glu Ala Arg Gln Ala Ile Lys Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Ile Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn

35

40

45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys
 50 55 60

Gly Asn Thr Leu Thr Cys Tyr Leu Lys Ala Ser Ala Ala Cys Arg Ala
 65 70 75 80

Ala Lys Leu Gln Asp Cys Thr Met Leu Val Asn Gly Asp Asp Leu Val
 85 90 95

Val Ile Cys Glu Ser Ala Gly Thr Gln Glu Asp Ala Ala Ser Leu Arg
 100 105 110

Val

<210> 122

<211> 113

<212> PRT

<213> hepatitis C virus

<400> 122

Ser Thr Val Thr Glu Arg Asp Ile Arg Thr Glu Glu Ser Ile Tyr Arg
 1 5 10 15

Ala Cys Ser Leu Pro Glu Glu Ala His Thr Ala Ile His Ser Leu Thr
 20 25 30

Glu Arg Leu Tyr Val Gly Gly Pro Met Phe Asn Ser Lys Gly Gln Thr
 35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Met
 50 55 60

Gly Asn Thr Ile Thr Cys Tyr Val Lys Ala Leu Ala Ala Cys Lys Ala
 65 70 75 80

Ala Gly Ile Ile Ala Pro Thr Met Leu Val Cys Gly Asp Asp Leu Val
 85 90 95

Val Ile Ser Glu Ser Gln Gly Thr Glu Glu Asp Glu Arg Asn Leu Arg
 100 105 110

Ala

<210> 123
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 123

Ser Thr Val Thr Glu Arg Asp Ile Arg Thr Glu Glu Ser Ile Tyr Gln
1 5 10 15

Ala Cys Ser Leu Pro Gln Glu Ala Arg Thr Val Ile His Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Val Gly Gly Pro Met Thr Asn Ser Lys Gly Gln Ser
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Phe Thr Thr Ser Met
50 55 60

Gly Asn Thr Met Thr Cys Tyr Ile Lys Ala Leu Ala Ala Cys Lys Ala
65 70 75 80

Ala Gly Ile Val Asp Pro Val Met Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Ile Ser Glu Ser Gln Gly Asn Glu Glu Asp Glu Arg Asn Leu Arg
100 105 110

Ala

<210> 124
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 124

Ser Thr Val Thr Glu Gln Asp Ile Arg Val Glu Glu Glu Ile Tyr Gln
1 5 10 15

Cys Cys Asn Leu Glu Pro Glu Ala Arg Arg Val Ile Ser Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Cys Gly Gly Pro Met Phe Asn Ser Lys Gly Ala Gln
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Pro Thr Ser Phe
50 55 60

Gly Asn Thr Ile Thr Cys Tyr Ile Lys Ala Thr Ala Ala Ala Lys Ala
65 70 75 80

Ala Gly Leu Arg Asn Pro Asp Phe Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Val Ala Glu Ser Asp Gly Val Asp Glu Asp Arg Ala Ala Leu Arg
100 105 110

Ala

<210> 125
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 125

Ser Thr Val Thr Glu Gln Asp Ile Arg Val Glu Glu Glu Ile Tyr Gln
1 5 10 15

Cys Cys Asn Leu Glu Pro Glu Ala Arg Lys Val Ile Ser Ser Leu Thr
20 25 30

Glu Arg Leu Tyr Cys Gly Gly Pro Met Tyr Asn Ser Lys Gly Val Gln
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Pro Thr Ser Phe
50 55 60

Gly Asn Thr Ile Thr Cys Tyr Ile Lys Ala Thr Ala Ala Ala Arg Ala
65 70 75 80

Ala Gly Leu Arg Asn Pro Asp Phe Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Val Ala Glu Ser Asp Gly Val Asp Glu Asp Arg Thr Ala Leu Arg
 100 105 110

Ala

<210> 126
 <211> 113
 <212> PRT
 <213> hepatitis C virus

<400> 126

Ser Thr Val Thr Glu His Asp Ile Arg Thr Glu Glu Glu Ile Tyr Gln
 1 5 10 15

Cys Cys Asp Leu Glu Pro Glu Ala Arg Lys Ala Ile Ser Ala Leu Thr
 20 25 30

Glu Arg Leu Tyr Ile Gly Gly Pro Met Tyr Asn Ser Lys Gly Leu Gln
 35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Pro Thr Ser Phe
 50 55 60

Gly Asn Thr Ile Thr Cys Tyr Ile Lys Ala Thr Ala Ala Ser Arg Ala
 65 70 75 80

Ala Gly Leu Lys Asp Pro Ser Phe Leu Val Cys Gly Asp Asp Leu Val
 85 90 95

Val Val Ser Glu Ser Cys Gly Val Glu Glu Asp Arg Ala Ala Leu Arg
 100 105 110

Ala

<210> 127
 <211> 113
 <212> PRT
 <213> hepatitis C virus

<400> 127

Ser Thr Val Thr Glu Gln Asp Ile Arg Thr Glu Glu Glu Ile Tyr Gln
 1 5 10 15

Cys Cys Asp Leu Glu Pro Glu Ala Arg Lys Ala Ile Ser Ala Leu Thr
20 25 30

Glu Arg Leu Tyr Ile Gly Gly Pro Met Tyr Asn Ser Lys Gly Leu Gln
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Leu Pro Thr Ser Phe
50 55 60

Gly Asn Thr Ile Thr Cys Tyr Ile Lys Ala Thr Ala Ala Ser Arg Ala
65 70 75 80

Ala Gly Leu Lys Asp Pro Ser Phe Leu Val Cys Gly Asp Asp Leu Val
85 90 95

Val Val Ser Glu Ser Cys Gly Val Glu Glu Asp Arg Ala Ala Leu Arg
100 105 110

Ala

<210> 128
<211> 113
<212> PRT
<213> hepatitis C virus

<400> 128

Ser Thr Val Thr Glu His Asp Ile Met Thr Glu Glu Ser Ile Tyr Gln
1 5 10 15

Ser Leu Tyr Leu Gln Pro Glu Ala Arg Val Ala Ile Arg Ser Leu Thr
20 25 30

Gln Arg Leu Tyr Cys Gly Gly Pro Met Tyr Asn Ser Lys Gly Gln Gln
35 40 45

Cys Gly Tyr Arg Arg Cys Arg Ala Ser Gly Val Phe Thr Thr Ser Met
50 55 60

Gly Asn Thr Met Thr Cys Tyr Ile Lys Ala Leu Ala Ser Cys Arg Ala
65 70 75 80

Ala Lys Leu Gln Asp Cys Thr Leu Leu Val Cys Gly Asp Asp Leu Val

85

90

95

Ala Ile Cys Glu Ser Gln Gly Thr His Glu Asp Lys Ala Ser Leu Arg
100 105 110

Ala